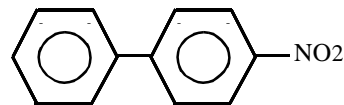


4-NITROBIPHENYL

4-Nitrobiphenyl is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 92-93-3

Molecular Formula: $C_{12}H_9NO_2$



4-Nitrobiphenyl occurs as needles and has a sweetish odor. It is insoluble in water, soluble in ether, benzene, chloroform, and acetic acid, and slightly soluble in cold alcohol (HSDB, 1991).

Physical Properties of 4-Nitrobiphenyl

Synonyms: 4-nitrodiphenyl; 4-phenyl-nitrobenzene; p-nitrodiphenyl; 4-nitro-1,1'-biphenyl; p-phenyl-nitrobenzene; p-nitrobiphenyl

Molecular Weight:	199.22
Boiling Point:	340 °C
Melting Point:	113 - 114 °C
Log Octanol/Water Partition Coefficient:	3.77
Henry's Law Constant:	3.54×10^{-6} atm-m ³ /mole at 25 °C
Conversion Factor:	1 ppm = 8.15 mg/m ³

(HSDB, 1991; Sax, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

4-Nitrobiphenyl was formerly used as a chemical intermediate for 4-aminobiphenyl. 4-Nitrobiphenyl is not currently manufactured, imported, used, or sold commercially in the United States (HSDB, 1991).

B. Emissions

No emissions of 4-nitrobiphenyl from stationary sources in California were reported, based on data obtained from the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of 4-nitrobiphenyl was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of 4-nitrobiphenyl. However, the United States Environmental Protection Agency (U.S. EPA) has compiled ambient air data from a 1986 study in Torrance, California. Mean concentrations of 4-nitrobiphenyl varied depending on the time of day: 0.5 nanograms per cubic meter (ng/m^3) during night-time hours to 6.0 ng/m^3 at daytime (U.S. EPA, 1993a).

INDOOR SOURCES AND CONCENTRATIONS

No information about indoor sources and concentrations of 4-nitrobiphenyl was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

4-Nitrobiphenyl is expected to exist primarily in the gas phase in the atmosphere. The dominant loss process for 4-nitrobiphenyl in the troposphere is expected to be by reaction with the hydroxyl (OH) radical, although photolysis may be important. The calculated half-life and lifetime of 4-nitrobiphenyl due to reaction with the OH radical are about 3 days and 4 days, respectively (Arey et al., 1990). In the particle phase, physical removal of 4-nitrobiphenyl may occur through wet and dry deposition (HSDB, 1991).

AB 2588 RISK ASSESSMENT INFORMATION

4-Nitrobiphenyl emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to 4-nitrobiphenyl are inhalation and dermal contact (HSDB, 1991).

Non-Cancer: Exposure to 4-nitrobiphenyl may cause irritation of eyes, nose, throat, and respiratory tract; headache, nausea, vomiting; and fatigue. Long-term exposure may cause effects on the peripheral and central nervous systems, liver, and kidney. The U.S. EPA has not established an oral Reference Dose (RfD) for 4-nitrobiphenyl, and the Reference Concentration (RfC) is under review. No information is available regarding adverse reproductive or

developmental effects of 4-nitrobiphenyl in humans or animals (U.S. EPA, 1994a).

Cancer: 4-Nitrobiphenyl is metabolized to 4-aminodiphenyl which is a potent bladder carcinogen in humans. The U.S. EPA has not classified 4-nitrobiphenyl for carcinogenicity (U.S. EPA, 1994a). The International Agency for Research on Cancer has classified 4-nitrobiphenyl in Group 3: Not classifiable as a carcinogen (IARC, 1987a). The State of California has determined under Proposition 65 that 4-nitrobiphenyl is a carcinogen (CCR, 1996).

